ZAYTSEV, A. (L'vov); SHUGAN, V. (L'vov)

First shoe trust. Sov. torg. 35 no.8:9-12 Ag '62. (MIRA 15:8)
(L'vov--Shoe industry)

YELISEYEV, Vladimir Fedorovich; ZHILOV, Ivan Ivanovich; KATAYEV, Afanasiy Filippovich; PELEVINA, Irina Osipovna; SHUGAN, Viktor Ustinovich, kand. ekon. nauk, dots., red.; BILENKO, L.S., red. izd-va; SOTNIKOVA, N.F., tekhn. red.

[The economics and planning of Soviet cooperative trade]Ekonomika i planirovanie sovetskoi kooperativnoi torgovli. [By]V.F.Eliseev i dr. Moskva, Izd-vo TSentrosoiuza, 1962. 354 p. (MIRA 16:3)
(Cooperative societies)

SHUGAR, A. I.

PA 11T48

USSR/Prisms May 1947
Spectral lines

"A Biprism for Visual Photometry of Spectral Lines,"
A. I. Shugar, 3 pp

"Zhur Eksp i Teor Fiz" Vol XVII, No 5

Brief description with diagrams and a photograph of the apparatus

11T48

SHUGAR, A.I., dots., kand.fiz.-mat.nauk

Calculation methods in the spectrum analysis of an element in a compound mixture with one known substance. Izv. TSKhA no.4: 223-224 '58. (MIRA 11:10)

(Spectrum analysis)

SHUGAR, A.I., dotsent, kand.fiziko-matemat.nauk; ROMANOVA, L.V.; SHUGAR, Yu.A.

Spectrum analysis of powders in condensed spark based on the method of two standard additions. Izv.TSKhA no.3:201-202 '59. (MIRA 12:10)

(Spectrum analysis)

SHUGAR, A.I., kand.fiziko-matematicheskikh nauk, dotsent; SHUGAR, Yu.A., starshiy nauchnyy sotrudnik

Photocalorimetric analysis of elements by using the method of calculating by the coefficient and adding interfering ions. Izv. TSKhA no.3:206-211 '60. (MIRA 14:4)
(Calorimetry)

SHUGAR, A. M.: Master Tech Sci (diss) -- "Investigation of the effect of packing on the extraction process in the RTP-192 bushing-drive coarse-linen machine". Moscow, 1959. 12 pp (Min Higher Educ USSR, Moscow Textile Inst), 150 copies (KL, No 18, 1959, 126)

SHUGAR, A.M.

Effect of condensers in the draft gear of a sliver can roving machine on the movement of fibers. Izv.vys.ucheb.zav.; tekh. tekst.prom. no.2:89-94 '59. (MIRA 12:6)

1. Moskovskiy tekstil'nyy institut.
(Spinning machinery)

BOLDIZHAR, Gnagli [Boldizsar, G.]; SHUGAR, A.M. [Sugar, A.]

Problems concerning the shape and dimension of modern rings and travelers. Tekst.prom. 23 no.4:37-43 Ap '63. (MIRA 16:4)

1. Issledovatel'skiy tekstil'noy promyshlennosti Vengerskoy Narodnoy Respubliki. (Hungary—Spinning machinery)

SHUGAR, D., aspirant.

Characteristics of the Neumann loom. Tekst. prom. 18 no.8:64-65 Ag '58. (MIRA 11:10)

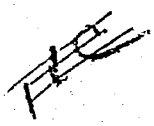
1.Kafedry teorii mekhanizmov i mashin Moskovskogo tekstil'nogo instituta.
(Germany, East--Looms)

SHUGAR, D., aspirant

Selvage forming mechanisms on Zultser looms. Tekst. prom. 19 no.5:87-90 My '59. (MIRA 12:10)

1.Kafedra teorii mekhanizmov i mashin Moskovskogo tekstil'nogo instituta.
(Looms)

SHUGAR, Derd'. Cand Tech Sci -- (diss) "Effect of the slay mechanism upon the unbalance of looms." Mos, 1959. 18 pp (Min of Higher and Secondary Specialized Education RSFSR. Mos Textile Inst), 150 copies (KL, 49-59, 141)



SHUGAR, D.

4

The binding of basic dyes by ribonucleic acid and the measurement of ribonuclease activity. D. Shugar (State Inst. Hyg., Warsaw). *Bull. acad. polon. sci., Classe II*, 1, 39–44(1953)(in English).—Ribonuclease activity is measured spectrophotometrically by following the change in the absorption spectrum of a soln. of basic dye and ribonucleic acid (RNA) to which ribonuclease (RNase) has been added. Methylene blue was the most convenient dye to use. The rate of change of optical d. at 5500 A. of a soln. contg. 20 γ/ml. methylene blue and 0.5 mg./ml. Na ribonucleate in 0.033*M* phosphate buffer, pH 7.2, 10 min. after addn. of RNase (temp. 22°) was almost directly proportional to the concn. of RNase. Changes in the absorption spectra of basic dyes (thionine, toluidine blue, pyronine, methylene blue, etc.) and the rate of enzymic hydrolysis were independent of the degree of polymerization of RNA. The optimum pH for RNase activity was around 7.5; the activity was almost zero at pH 4. This suggests that the enzyme interacts with the ionized phosphate groups of nucleic acid. Since the rate of enzymic hydrolysis of RNA was the same in the presence and absence of the dye, it appears that groups other than ionized phosphate groups are also involved in the binding of basic dyes by RNA. A. S. S.

SHUGAR, D.

"The Riboflavin Photo-sensitized Oxidation of some 3-substituted Indole Derivatives", P. 3, (ACTA BIOCHIMICA POLONICA, Vol. 1 No. 1/2, 1954, Warszawa, Poland)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 5 May 1955, Uncl.

SHUGAR, D.

✓Gram stain: conversion of natural Gram-negative organisms to Gram-positive state. D. Shugar and J. Baranowska (*Bull. Acad. Polon. Sci.*, 1954, 2, [redacted] 0·15 ml. of 4% formaldehyde, pH 7, and 0·5 ml. of 0·4% protein (protamine, lysozyme, or aldolase) were added to 4 ml. of saline suspensions of various Gram-negative organisms (Pneumococcus, Friedlander, *Neisseria catarrhalis*, *Escherichia coli*, proteus, and aerobacter) grown on test tube agar slants, with or without prior extraction of the cells for 4—10 hr. with 2% bile salts, gradual conversion from the Gram-negative to the Gram-positive state occurred. The change began to be visible within 15—30 min. and max. positivity was attained in 2—18 hr. No change in the Gram staining behaviour occurred following treatment of the bacteria with formaldehyde alone or protein alone. The change from the Gram-negative to the Gram-positive state occurred more rapidly in the cells previously extracted with bile salts. This treatment conferred Gram-positivity on both natural Gram-negative and on extracted Gram-positive organisms. Although the conversion of Gram-negative organisms to the Gram-positive state by treatment with magnesium ribonucleate and by desoxyribonucleic acid has been reported in the literature, attempts to achieve this were unsuccessful. These observations strengthen the doubts about the essential rôle of nucleic acids in the Gram stain.

A. Acknow. J

SHUGAR, D

POL. 4

Kinetics of heat inactivation of lysozyme and the influence of various buffers and manganese ions. D. Shugar and E. Syruczek (State Inst. Hyg., Warsaw). *Bull. Acad. polon. sci., Classe II*, 2, No. 2, 73-9(1954)(in English).—The rate of heat inactivation of cryst. lysozyme followed an irreversible 1st-order equation. The dependence of the rate on temp. followed the Arrhenius equation, but fell off above pH 8, although the reaction remained 1st order. It is suggested that the deviations above pH 8 may be related to the temp. coeff. of the dissocn. of the basic groups of lysozyme. In neutral and acid medium the values of the expti. activation energy (E) and entropy of activation did not differ markedly from those of ordinary chem. reactions. The thermodynamic consts., E, $\Delta H^{\ddagger}$, $\Delta F^{\ddagger}$, and $\Delta S^{\ddagger}$, resp., were, at pH 2–4, 90°, 0.01N HCl and acetate buffer, 19.6, 18.7, 27.7, −24.3 kcal./mole°; pH 6.2, 90°, phosphate buffer (I), 24.3, 23.6, 27.3, −10.2 kcal./mole°; pH 7.2, 90°, I, 33.5, 32.8, 26.2, 18.2 kcal./mole°; pH 8, 80°, I, 17.0, 34.9, 25.6, 26.4 kcal./mole°; pH 12, 49°, 0.01N NaOH, 53, 52.3, 23.5, 89.2 kcal./mole°. Mn^{++}, 0.01M, inhibited the rate of inactivation at pH above 8, to some extent at pH 5.7 in acetate, and considerably less in I. Acetate, pH 5.7, also retarded the rate of inactivation. Tris(hydroxymethyl)aminomethane buffer at pH 6.75 and 8.3 retarded considerably the rate of inactivation compared with that in I or acetate, while the addn. of Mn^{++} slowed the reaction still further.

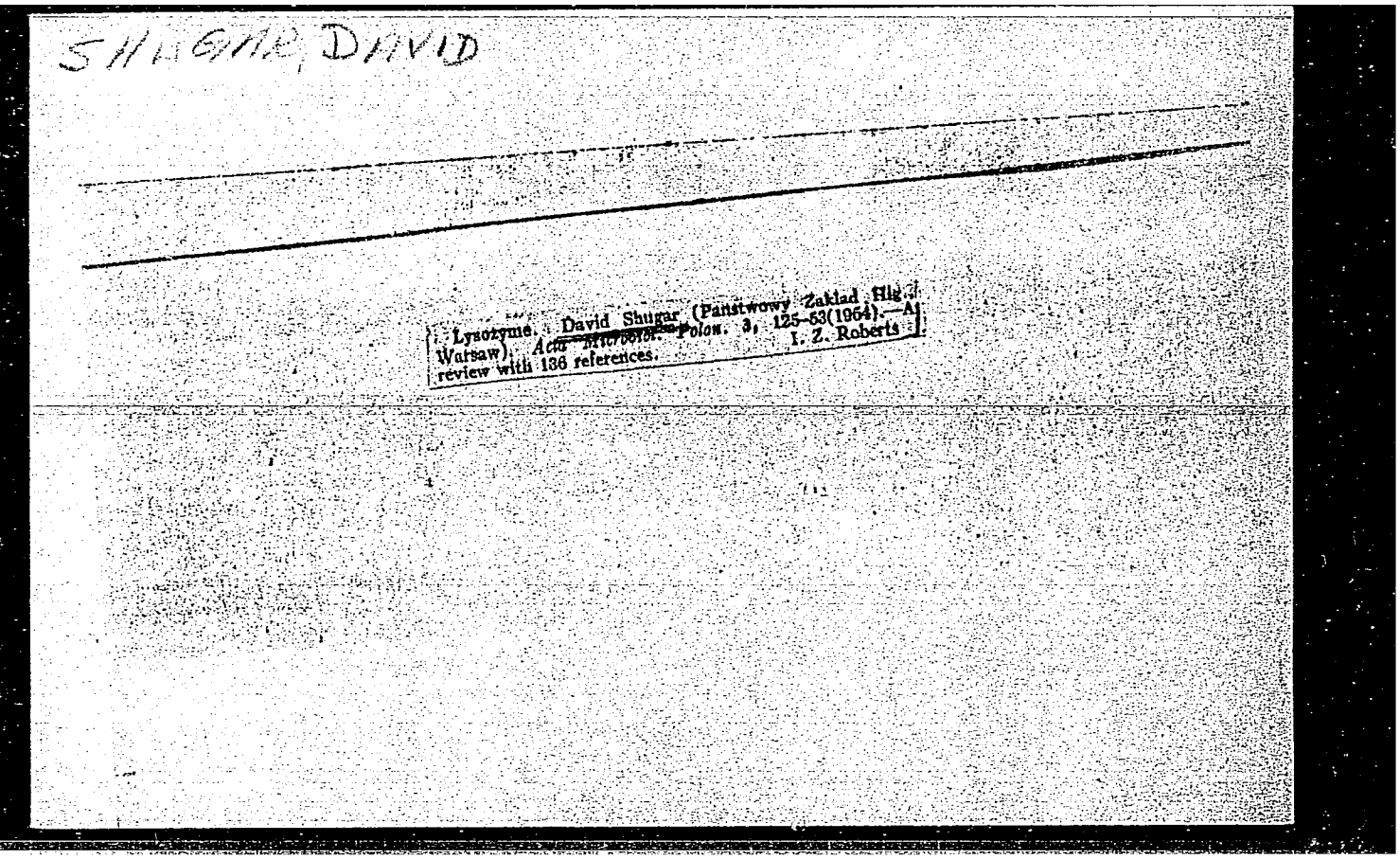
Roland F. Beers, Jr.

(1)

STANDARD

Gram stain; the importance of proteins in the gram reaction. D. Shugar and J. Baranowska (Biochem. Dept. P.Z.H., Warsaw). *Acta Microbiol. Polon.* 3, 11-20(1954) (in English).--Gram-pos. microörganisms, including *Saccharomyces cerevisiae*, *Bacillus subtilis*, *B. stearothermophilus*, *Micrococcus lysodeikticus*, *M. pyogenes* var. *aureus*, and *Clostridium perfringens*, were transferred into gram-neg. through the addn. of bile salts to give a final concn. of 2%. The cells were extd. in the bile salt soln. at 60°. Smears were prepd. and stained at intervals until all cells were gram-neg. The Hucker gram-staining technique was used. The time required for the transfer varied from 2-10 hrs. for *B. subtilis* and *B. stearothermophilus* to 30-48 hrs. for *C. perfringens* and *S. cerevisiae*. Similar results were obtained when cryst. ribonuclease was used instead of bile salts. The organisms were reversed into a gram-pos. form through the addn. of a mixt. of protein and HCHO to the washed suspension of cells, to give a final concn. of 0.05 and 0.15%, resp. Proteins used in the expts. included lysozyme, salmine, clupeine sulfates, aldolase, insulin, and triose phosphate dehydrogenase. The findings suggest the important role of proteins in the gram reaction. However, it was not possible to conclude if the importance is connected with free proteins or complexes of proteins within the cells.

Richard Ehrlich



SHUGAR, DAVID

Lysozyme. David Shugar (Państwowy Zakład Hig., Warsaw). *Acta Microbiol. Polon.* 3, 125–53(1964).—A review with 136 references. I. Z. Roberts

SHUGAR, D.

Effect of ultraviolet rays on ribonuclease. Acta physiol. polon. 5 no.4:633-634 1954.

1. Z Dzialu Biochemii Panstwowego Zakladu Higieny w Warszawie. Kierownik: prof. dr J.Heller.

(NUCLEASES,
ribonuclease, eff. of ultraviolet rays)
(ULTRAVIOLET RAYS, effects,
on ribonuclease)

SHUGAR, D.

SYRUCZEK, E.; SHUGAR, D.

Kinetics of inactivation of ribonuclease with heat. Acta physiol. polon. 5 no.4:634-635 1954.

1. D Dzialu Biochemii Panstwowego Zakladu Higieny w Warszawie. Kierownik: prof. dr J.Heller.

(NUCLEASES,
ribonuclease, inactivation with heat)
(HEAT, effects,
on ribonuclease, incactivation)

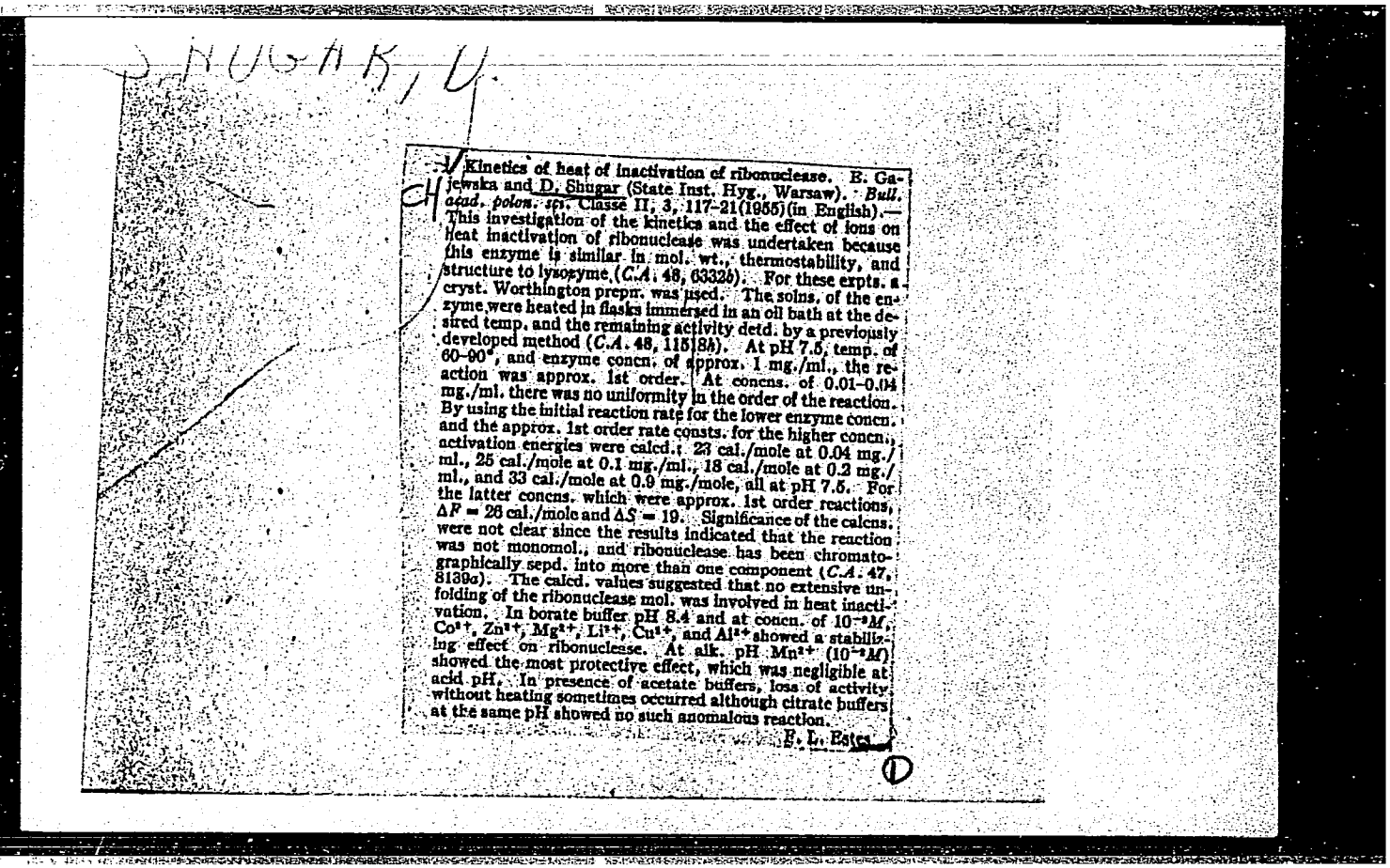
SHUGAR, D.

Production of streptokinase and streptodornase. Roman Pakula, Marian T., Włodzimierz Walczak, and Dawid Shugar (Państwowy Zakład Hig., Warsaw). *Med. Doświadczalna i Mikrobiol.* 5, 335-37(1953); cf. Christensen, C.A. 41, 7425.—Streptokinase (SK) and streptodornase (SD) are produced by a hemolytic strain of streptococci (I) which does not produce appreciable concn. of hyaluronidase, streptolysin, and toxin. I is grown in a medium contg. meat, peptone and yeast hydrolyzates, glucose, inorg. components, and compds. which lower the oxidation reduction potential of the medium. The culture is continually neutralized. Max. yield is reached after 18-20 hrs. The culture is acidified to pH 4, the ppt. suspended in slightly alk. medium, bacteria are centrifuged off, and the active compds. contaminated with some inactive proteins repptd. at pH 4. Adjusting the pH to 6.5 removes some of the impurities. The mixt. of SK and SD is dissolved in slightly alk. buffer. The two enzymes could not be sepd. and the final yield was 60% for both (of the content of the medium); the prepn. is nontoxic and nonpyrogenic to mice and active clinically.

I. Z. Roberts

SHUGAR, DAVID

The nature and mechanism of Gram staining of bacteria. David Shugar. *Postępy Hig. i Med. Doświadczalnej* 8, No. 1, 87–135(1954).—A review with 159 references. E. W. MD



Kinetics of heat of inactivation of ribonuclease. B. Gajewska and D. Shugar (State Inst. Hyg., Warsaw). *Bull. acad. polon. sci. Classe II*, 3, 117–21(1955)(in English).—This investigation of the kinetics and the effect of ions on heat inactivation of ribonuclease was undertaken because this enzyme is similar in mol. wt., thermostability, and structure to lysozyme (*C.A.* 48, 6332*b*). For these expts. a cryst. Worthington prepn. was used. The solns. of the enzyme were heated in flasks immersed in an oil bath at the desired temp. and the remaining activity detd. by a previously developed method (*C.A.* 48, 1151*b*). At pH 7.5, temp. of 60–90°, and enzyme concn. of approx. 1 mg./ml., the reaction was approx. 1st order. At concns. of 0.01–0.04 mg./ml. there was no uniformity in the order of the reaction. By using the initial reaction rate for the lower enzyme concn. and the approx. 1st order rate consts. for the higher concn., activation energies were calcd.: 23 cal./mole at 0.04 mg./ml., 25 cal./mole at 0.1 mg./ml., 18 cal./mole at 0.2 mg./ml., and 33 cal./mole at 0.9 mg./mole, all at pH 7.5. For the latter concns. which were approx. 1st order reactions, ΔF = 26 cal./mole and ΔS = 19. Significance of the calcns. were not clear since the results indicated that the reaction was not monomol., and ribonuclease has been chromatographically sepd. into more than one component (*C.A.* 47, 8139*a*). The calcd. values suggested that no extensive unfolding of the ribonuclease mol. was involved in heat inactivation. In borate buffer pH 8.4 and at concn. of $10^{-3}M$, Co^{++}, Zn^{++}, Mg^{++}, Li^{+}, Cu^{++}, and Al^{+++} showed a stabilizing effect on ribonuclease. At alk. pH Mn^{++} ($10^{-3}M$) showed the most protective effect, which was negligible at acid pH. In presence of acetate buffers, loss of activity without heating sometimes occurred although citrate buffers at the same pH showed no such anomalous reaction.

F. L. Estes

D

SHUGAR, D.

543. Electron microscopy of thermophilic bacteria. D. Shugar, A. Jarmolińska, and A. Feltynowski *Bull. Acad. Polon. Sci.*, 1955, 3, 211—212 (Dept. of Biochem., State Inst. of Hyg., Warsaw).—E.m. observations were made on several strains of thermophilic bacteria (*Bacillus* spp.) isolated from natural fertilisers at 65° on agar slants, and selected for their ability to show reasonably good growth over the temp. range 45—65°. There was no sign of any special protective membrane, capsule or coating, to protect the protoplasmic constituents against the high temp. Nor is the cell wall of any of these strains thicker than the cell walls of mesophilic strains. The cell wall thickness of a given strain showed no variation with temp. as might be expected if it played some protective rôle.

B. VINEY.

SHUGAR, D.

1955

Med

542. Electron microscope observations on thermophilic bacteria. D. Shugar, A. Jarmolińska, and A. Feltynowski *Acta microbiol. polon.*, 4, 177—182 /(Państwowy Zakład Hygieny w Warszawie).—

3

The results obtained point to a similarity in gross structure between thermophils and mesophils. There were no signs of protective capsules or thickened cell walls. B. VINEY.

Shugar, Dawid

Adsorption method for the separation of streptokinase and streptodornase. Romin Pakuła, Marian Tyc, and Dawid Shugar. *Med. Doświadczalna i Mikrobiol.* 7, 323–9 (1955)(English summary).—Streptokinase (I) and streptodornase (II) are sepd. by an adsorption method with Hyflo-Super-Cel. The yield of each enzyme in activity units in respect to supernatant is 40% and in respect to the concentrate is about 55%. The activity of I in the final prepn. is 6500 Christensen units per mg. while the activity of II is 1500 units per mg. (based on Welkome Dornokinase). The final lyophilized I contains 0.7% of II activity; while the final II contains 1% of I activity. Properties are described.
Kathryn D. Kuck

(2)

SHUGAR, D.

3881. **Heat inactivation of ribonuclease in the presence of foreign proteins.** E. Gajewska and D. Shugar *Bull. Acad. polon. Sci.*, 1956, 4, 157—162 (Inst. of Biochem., Polish Academy of Sci., Warsaw, Poland).—An examination was made of the inactivation of dil. soln. of ribonuclease in the presence of such concn. of pepsin as are normally inactivated according to a first-order reaction. Subsequently the influence of a no. of other proteins was examined, including egg albumin, trypsin, lysozyme, protamine, and insulin. It appears reasonable to assume that the heat inactivation of ribonuclease alone is accompanied by the formation of sol. aggregates. The effects of tris buffer are also considered. B. VINEY

SHUGAR, D.

5603. Ultraviolet photolysis of ribonuclease. D. Shugar and F. Rzendowska *Bull. Acad. polon. Sci.*, 1950, 4, 293—298 (Dept. of Biochem., State Inst. of Hygiene, Warsaw, Poland).—The McCarty procedure for ribonuclease [RNase] assay shows that after short periods of irradiation, there is an increase in enzyme activity followed by normal inactivation. However, in the colorimetric procedure for RNase assay, there is no activation and the inactivation is of the first order, quantum yields being independent of concn. As in the case of lysozyme, cysteine does not protect RNase from inactivation, except at low enzyme concn., where the absorption by the cysteine is high compared with that of the enzyme. The inactivation of the enzyme in 95° ethanol is no different from that in soln. As with lysozyme, no free amino acids or small peptides are liberated during the inactivation of RNase.

E. M. RATTENBURY

SHUGAR, D.

KOCHANSKA, Z.; SHUGAR, D.

Deamination of purines during acid hydrolysis of nucleic acids.
Acta biochim. polon. 3 no.4:591-594 1956.

1. Z Pracowni Biofizyki Zakladu Biochemii PAN w Warszawie.
(NUCLEIC ACIDS,
hydrolysis, deamination of purines in (Pol))
(PURINES,
deamination in hydrolysis of nucleic acids (Pol))

SHUGAR, D.; RZENDOWSKA, F.

Studies on photochemistry of ribonuclease. Acta biochim. polon. 3 no.4:595-605 1956.

1. Z Zakladu Biochemii P.Z.H. w Warszawie.
(RIBONUCLEASE,
eff. of ultraviolet rays (Pol))
(ULTRAVIOLET RAYS, effects,
on ribonuclease (Pol))

SZEMPLINSKA, E.; SZENBERG, A.; SHUGAR, D.

Use of commercial preparations of streptococcal desoxyribonuclease for histochemical purposes. Acta biochim. polon. 3 no.4:607-612 1956.

1. Z Zakladu Biochemii PZH i Zakladu Biochemii PAN w Warszawie.
(STREPTODORNASE AND STREPTOKINASE,
commercial streptoc. streptodornase (Pol))

F

POLAND / Microbiology. General Microbiology.
Investigatory Methods and Techniques.

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 19393

Author : Shugar, D.; Baranowska, J.
Inst : Polish Academy of Sciences
Title : Application of I131 to Quantitative Studies on Gram Staining

Orig Pub : Bull. Acad. polon. sci., 1957, cl. 2, 5, No 5-6, 165-168

Abstract : No abstract given

Card 1/1

BARANOWSKA, J.; SHUGAR, D.

The role of proteins in, and the question of localization of the Gram reaction. Acta microb. polon. 6 no.2: 107-114 1957.

1. From the Department of Biochemisty, State Institute of Hygiene, Warszawa Revived 3 November 1956.

(BACTERIA, metab.
proteins, eff. on Gram staining reaction)
(PROTEINS, metab.
bact., eff. on Gram staining reaction)
(STAINS & STAINING
Gram reaction, eff. of protein metab. of bact.

SHUGAR, D.; JARMOLINSKA, A.

Thermophilous bacteria. p. 10,

(PRZEMYSL SPOZYWCZY. Vol. 11, No. 1, Jan. 1957, Warszawa, Poland.)

SO: Monthly List of East European Accessions (EEAL) Lc. vol. 6, No. 10, October 1957. Uncl.

was accompanied by the simultaneous appearance of a new max. at 2360 A. The reaction was reversible by acid or heat in the pH range of nondissocn. of potentially dissociable groups. The quantum yields for photolysis of I nucleosides and nucleotides were approx. 1 order of magnitude greater than those for I and II. A somewhat similar situation held for uracil derivs. The rate of photolysis of 1-methyluracil, I, and cytidine in D_2O was about $^1/_2$ that in H_2O, and the reaction was 1st order in both. The reverse reaction, involving elimination of a mole of H_2O from the photolysis products, was 2–3 times as fast in D_2O as in H_2O. Reversal of the photolysis of nucleic acids was studied. Indirect evidence was obtained for about 10–15% reversibility by heat with ribonucleic acid (RNA). A sample of apurinic acid showed considerable reversibility. The quantum yields for photolysis of the pyrimidine components of RNA were of the same order of magnitude as those of the free nucleotides. Morton Puder

pm
MIT

Shugar, D., and others

The application of labeled compounds in quantitative staining reactions in biology, p. 513.

NUKLEONIKA. (Polska Akademia Nauk. Komitet do Spraw Pokojowego Wykorzystania Energii Jadrowej) Warszawa., Vol 3, no 5, 1958.
Poland

Monthly List of European Accessions (EEAI) LC, Vol 8, no. 7, July 1959.

Uncl.

SHUGAR, D.; WIERZCHOWSKI, K.L.

Photochemistry of nucleic acids and of their components. Postepy biochem. 4 no.2:187-197 1958.

(NUCLEIC ACIDS, photochem. (Pol))

SHUGAR, D.; WIERZCHOWSKI, L.

Photochemistry of nucleic acids, nucleic acid derivatives and related compounds. Postepy biochem. 4 no.2:243-296 Suppl. 1958.

(NUCLEIC ACIDS
photochem., review)
(NUCLEOSIDES AND NUCLEOTIDES,
photochem., review)

SHUGAR, D.; SIERAKOWSKA, H.; SZENBERG, A.

Quantitative staining with radioactive indicators: - alkaline phosphatase. Acta biochim. polon. 5 no.1:27-46 1958.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw.

(PHOSPHATASES, determination
quantitative determ. with radioactive indicators)

7

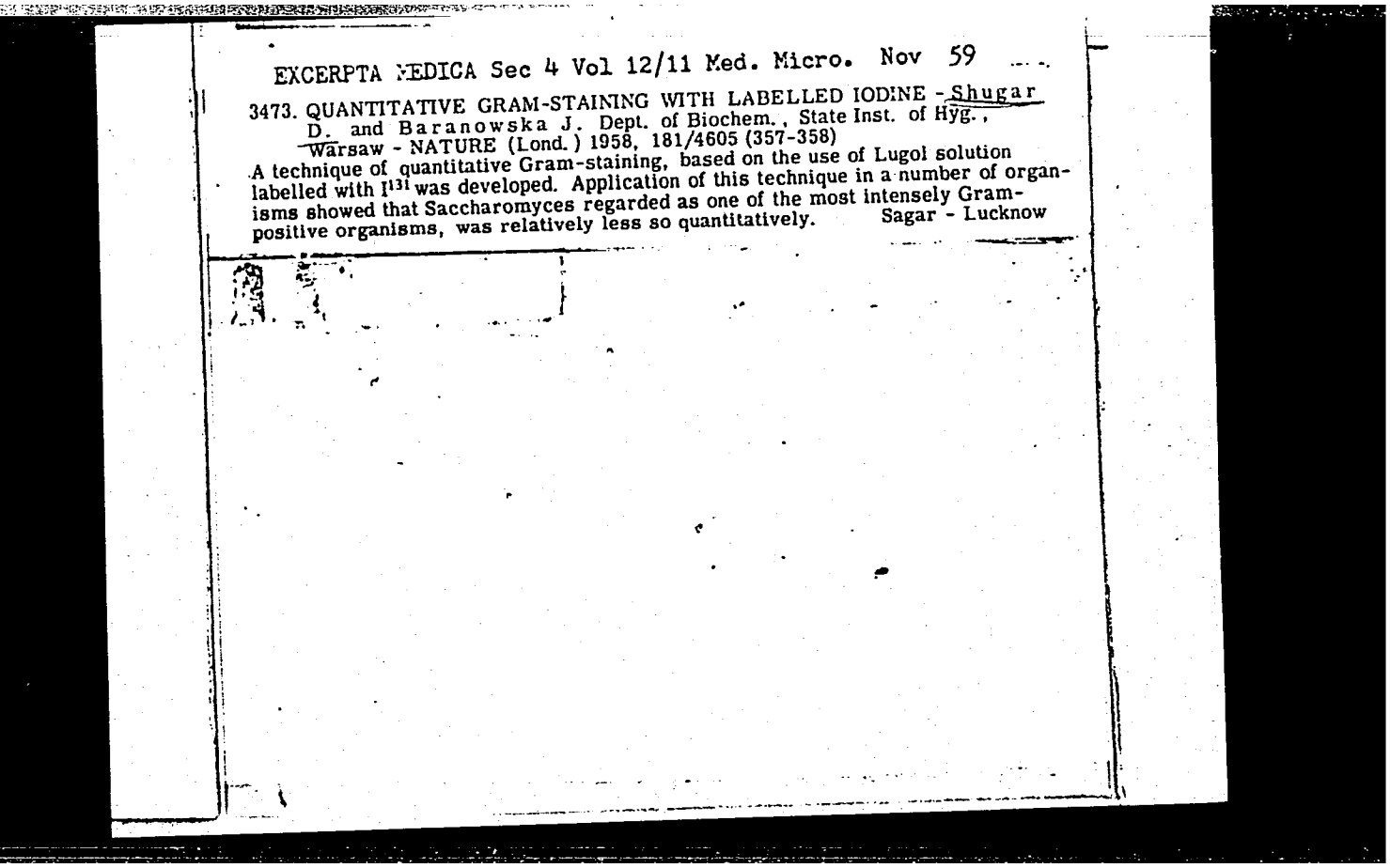
Structure and photochemical behavior of nucleic acids and related components. D. Shugar and K. L. Wierzchowski (Acad. Sci., Warsaw). *J. Polymer Sci.* 31, 269–80(1958).—A study was made of the photochem. behavior at 2537 A. of 2′-, 3′-, 5′- and cyclic 2′, 3′-cytidylic acids and various prepns. of apurinic, ribonucleic, and deaminated ribonucleic acids. Their behavior is qualitatively similar and support the suggestion of H bonding in cytosine nucleosides and nucleotides between the pyrimidine 2-carbonyl and the 5′-sugar hydroxyl which influences the photochem. reaction.

M. H. Dauria

3

2 May

JW



EXCERPTA MEDICA Sec 4 Vol 12/11 Med. Micro. Nov 59

3473. QUANTITATIVE GRAM-STAINING WITH LABELLED IODINE - Shugar D. and Baranowska J. Dept. of Biochem., State Inst. of Hyg., Warsaw - NATURE (Lond.) 1958, 181/4605 (357-358)

A technique of quantitative Gram-staining, based on the use of Lugol solution labelled with I^{131} was developed. Application of this technique in a number of organisms showed that Saccharomyces regarded as one of the most intensely Gram-positive organisms, was relatively less so quantitatively. Sagar - Lucknow

TRAMER, Zofia; SHUGAR, D.

Studies on phenolic hydroxyl binding in proteins. Acta biochim. polon. 6 no.2:235-251 '59.

1. Instytut Biochemii i Biofizyki PAN, Warszawa.
(PROTEINS - chemistry)

WIERZCHOWSKI, K.L.; SHUGAR, D.

Studies of reversible photolysis in oligo-and poly-uridylic acids. Acta biochim.polon. 6 no.3: 313-334 '59.

1. Instytut Biochemii i Biofizyki Polskiej Akademii Nauk, Warszawa. (NUCLEOSIDES AND NUCLEOTIDES chem.)

SHUGAR, D.; ADAMIEC, A.; SZTUMPF, Ewa

Role of peptide bond absorption in protein photochemistry.
Acta biochim.polon. 6 no.4:417-423 '59.

1. Department of Biochemistry, State Institute of Hygiene, Warsaw.

(PROTEINS chem)
(PEPTIDES chem)

ADAMIEC, A.; SHUGAR, D.

Two procedures for following the kinetics of degradation of apurinic acid. Acta biochim.polon. 6 no.4:425-430 '59.

1. Department of Biochemistry, State Institute of Hygiene, Warsaw.

(DESOXYRIBONUCLEIC ACID rel cpds)

BITNY-SZLACHTO,S.; SHUGAR,D.

Quantitative staining with radioactive indicators. Preparation of ^{14}C-labeled crystal violet and methyl green. Bul Ac Pol biol 7 no.8:293-297 '59. (MLAI 9:6)

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences. Presented by J.Heller.
(Stains and staining (Microscopy))
(Crystal violet) (Methyl green) (Carbon)

WIERZCHOWSKI, K.L.; SHUGAR, D.

Further studies on the photochemistry of pyrimidines, with special reference to 5-and 6-substituted derivatives in relation to photoreactivation in the T-even bacteriophages. Acta biochim.polon. 7 no.1:63-84 '60.

1. Instytut Biochemii i Biofizyki, Polska Akademia Nauk, Warszawa
(PYRIMIDINES chem.)
(BACTERIOPHAGE)
(LIGHT)

JANION, Celina; SHUGAR, D.

Absorption spectra, structure and behaviour towards some enzymes of dihydropyrimidines and dihydro-oligonucleotides. Acta biochim. polon. 7 no.2/3:309-328 '60.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw.
(PYRIMIDINES chem)
(NUCLEOSIDES AND NUCLEOTIDES)
(ULTRAVIOLET RAYS)

WIERZCHOWSKI, K.L.; SHUGAR, D.

Photochemistry of model oligo- and polynucleotides. II. Homopolymers of adenylic, guanylic and cytidylic acids and several heteropolymers. Acta biochim.polon. 7 no.2/3:377-399 '60.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw.
(NUCLEIC ACIDS chem)
(NUCLEOSIDES AND NUCLEOTIDES chem)
(ULTRAVIOLET RAYS)

SIERAKOWSKA, Halina; SHUGAR, D.

Investigations on histochemical localization of nuclease enzymes.
Acta biochim.polon. 7 no.4:475-489 '60.

1. Institute of Biochemistry & Biophysics, Polish Academy of Sciences, Warsaw.
(NUCLEASES chem)

SZER, W.; SHUGAR, D.

N-methylation of uridylic acid and preparation of oligonucleotides of 3-methyluridylic acid. Acta biochim.polon. 7 no.4:491-504 '60.

1. Institute of Biochemistry & Biophysics, Academy of Sciences, Warsaw.
(NUCLEOSIDES AND NUCLEOTIDES chem)

BARANOWSKA, Joanna; SHUGAR, D.

Photochemistry of model oligo- and poly-nucleotides. III. Cross-linking and staining properties of ultraviolet irradiated films of nucleic acids and oligonucleotides. Acta biochim.polon. 7 no.4: 505-520 '60.

1. Department of Biochemistry, State Institute of Hygiene, Warsaw.
(NUCLEOSIDES AND NUCLEOTIDES chem)
(ULTRAVIOLET RAYS)
(NUCLEIC ACIDS chem)

TRAMER, Zofia; SHUGAR, David

Construction of a small "open" cobalt source for radiobiological investigations. Nukleonika 6 no.10:667-674 '61.

1. Instytut Biochemii i Biofizyki, Polska Akademia Nauk, Warszawa, i Zaklad Biochemii, Panstwowy Zaklad Higieny, Warszawa.

(Radiobiology)

WIERZCHOWSKI, K.L., SHUGAR, D.

Photochemistry of cytosine nucleosides and nucleotides. II. Acta biochim. polon. 8 no.2:219-234 '61.

1. Institute of Biochemistry and biophysics, Polish Academy of Sciences, Warsaw
(NUCLEOSIDES AND NUCLEOTIDES chem)

SZER, W; SHUGAR, D.

The preparation and properties of high molecular weight polymers of N-methyluridylic acid. Acta biochim. polon. 8 no.2:235-249 '61.

1. Institute of Biochemistry & Biophysics, Polish Academy of Sciences, Warsaw
(NUCLEOSIDES AND NUCLEOTIDES chem)

JANION, Celina; SHUGAR, D.

Thymidine phosphorylase and other enzymes in regenerating rat liver. Acta biochim. polon. 8 no.3:327-344 '61.

1. Institute of Biochemistry & Biophysics, Polish Academy of Sciences, Warszawa

(PHOSPHORYLASES metab)
(LIVER metab)

JANION, Celina; SHUGAR, D.

Thymidine phosphorylase and other enzymes in regenerating rat liver. Acta biochim 8 no.3:337-344 '61.

1. Institute of Biochemistry & Biophysics, Polish Academy of Sciences, Warsaw.

(ENZYMES)

SZER, W.; SHUGAR, D.

Synthesis and physico-chemical and enzymatic properties of 5-bromo derivatives of uridine phosphates and their polymers. Acta biochim 8 no.3:363-375 '61.

1. Institute of Biochemistry & Biophysics, Polish Academy of Sciences, Warsaw.

(URIDINE PHOSPHATES)

PAKULA, R.; WALCZAK, W.; SHUGAR, D.

Inactivation of the streptomycin resistance markers of three species of bacteria by ionizing radiation. Acta biochim. polon. 8 no.4:413-425 '61.

1. Departments of Microbiology and Biochemistry, State Institute of Hygiene, Warszawa

(STREPTOMYCIN) (ULTRAVIOLET RAYS)
(DESOXYRIBONUCLEIC ACID metab) (RADIATION EFFECTS)
(BACTERIA radiation eff)

SIERAKOWSKA, Halina; SHUGAR, D.

Gross histochemical localization of tissue nuclease enzymes. Acta biochim. polon. 8 no.4:427-436 '61.

1. Institute of Biochemistry & Biophysics, Polish Academy of Sciences, and Department of Biochemistry, State Institute of Hygiene, Warszawa. (NUCLEASES chem)

BARSZCZ, Daniela; SHUGAR, D.

Radiation chemistry of nucleic acids and their derivatives. I. Some pyrimidines, dihydropyrimidines and hydrated pyrimidines. Acta biochim. polon. 8 no.4:455-471 '61.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.
(NUCLEIC ACIDS chem) (RADIATION EFFECTS)
(PYRIMIDINES chem)

SHER, V.; SHUGAR, D.

Chemical and enzymatic properties of methyl esters of 5'-phosphates of some pyrimidine nucleosides. Biokhimiia 26 no.5:840-845 S-O '61. (MIRA 14:12)

1. Institute of Biochemistry and Biophysics, Academy of Sciences, Warsaw.

(NUCLEOSIDES) (PHOSPHATES)

SZER, W.; SHUGAR, D.

A note on the stability of pyrimidine nucleoside cyclic phosphate methyl esters and the mode of action of ribonuclease. Acta biochim. polon. 9 no.2:131-135 '62.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.
(NUCLEOSIDES AND NUCLEOTIDES chem) (RIBONUCLEASE chem)

PAKULA, R.; WALCZAK, W.; SHUGAR, D.

Oxygen and dose-rate effects on survival curves of γ-irradiated transforming DNA in the presence of protective substances. Acta biochim. polon. 9 no.3:227-237 '62.

1. State Institute of Hygiene, Warszawa.
(DESOXYRIBONUCLEIC ACID - radiation effects)
(SULFHYDRYL COMPOUNDS - pharmacology) (THIOUREA - pharmacology)
(CYSTEINE - pharmacology)

SZEMPLINSKA, Halina; SIERAKOWSKA, Halina; SHUGAR, D.

Histochemical localization of hyaluronidase and amylase by the film-substrate technique. Acta biochim. polon. 9 no.3:239-244 '62.

1. Department of Biochemistry, State Institute of Hygiene; and Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.
(HYALURONIDASE - chemistry) (AMYLASES - chemistry)
(HISTOLOGICAL TECHNIQUES)

JANION, Celina; SHUGAR, D.

Influence of γ-irradiation on liver regeneration in normal and starved rats. Acta biochim. polon. 9 no.3:271-280 '62.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.

(RADIATION EFFECTS - experimental) (REGENERATION - experimental) (STARVATION - experimental) (LIVER - radiation effects)

TRAMER, Zofia; SHUGAR, D.

Deuteron and γ-irradiation of dried preparations of lysozyme and ribonuclease. Acta biochim. polon. 9 no.3:281-293 '62.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warzawa.
(LYSOZYME - radiation effects) (RIBONUCLEASE - radiation effects)
(RADIATION EFFECTS - experimental)

ZMUDZKA, Barbara; SZER, W.; SHUGAR, D.

Preparation and chemical and enzymic properties of phosphate esters of 1-(β-D-glucopyranosyl)uracil and -thymine. Acta biochim. pol. 9 no.4:321-341 '62.

1. Department of Biochemistry, State Institute of Hygiene, and Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.
(URACIL NUCLEOTIDES) (NUCLEOTIDES) (VENOMS)
(RIBONUCLEASE) (PHOSPHOTRANSFERASES) (PHOSPHATASES)

SHUGAR, Dawid

The International Congress on Biophysics. Kosmos Biologia 11 no.2: 244-246 '62.

BARSZCZ, Daniela; TRAMER, Zofia; SHUGAR, D.

Bromination of thymine and photochemistry of 5-bromo-6-hydroxyhydrothymine analogues. Acta biochim. pol. 10 no.1:9 '63.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.

(NO SUBJECT HEADINGS)

BERENS, K.; SHUGAR, D.

Ultraviolet absorption spectra and structure of halogenated uracils and their glycosides. Acta biochim. pol. 10 no.1:25 '63.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.

(NO SUBJECT HEADINGS)

SZER, W.; SWIERKOWSKI, M.; SHUGAR, D.

Secondary structure of poly-uridylic and poly-ribothymidylic acids, their N-methylated analogues, and their 1:1 complexes with poly-A. Acta biochim. pol. 10 no.1:87 '63.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences; and Dept. of Biochemistry, State Institute of Hygiene, Warszawa.
(NO SUBJECT HEADINGS)

SZER, W.; SHUGAR, D.

Preparation of poly-5-fluorouridylic acid and the properties of halogenated poly-uridylic acids and their complexes with poly-adenylic acid. Acta biochim. pol. 10 no.2:219-231 '63.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.
(URACIL NUCLEOTIDES) (ADENINE NUCLEOTIDES) (CHEMISTRY)

PIECHOWSKA, Miroslawa; SHUGAR, D.

Fractionation of native and heat denatured transforming DNA by chloroform treatment. Acta biochim. polon. 10 no.3:263-277 '63.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.
(DNA) (CHLOROFORM) (HEAT) (CHEMISTRY, ANALYTICAL)
(DNA, BACTERIAL) (STREPTOCOCCUS)

SIERAKOWSKA, Halina; SZEMPLINSKA, Halina; SHUGAR, D.

Intracellular localization of phosphodiesterase by a cytochemical method. Acta biochim. pol. 10 no.4:399-411 '63.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, and Dept. of Biochemistry, State Institute of Hygiene, Warszawa.
(PHOSPHATASES) (HISTOCHEMISTRY) (KIDNEY)
(PANCREAS) (DUODENUM) (THYROID GLAND)
(LIVER ENZYMOLOGY) (TRACHEA) (TONGUE)
(PAROTID GLAND) (SPLEEN) (SUBLINGUAL GLAND)
(SUBMAXILLARY GLAND)

BARSZCZ, Daniela; SHUGAR, D.

Influence of temperature on the stability of the acid and alkaline forms of polyriboadenylic acid. Acta biochim. Pol. 11 no.4:481-496 '64.

1. Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.

ZMUDZKA, Barbara; SHUGAR, D.

Preparation and chemical and enzymic properties of cyclic phosphates of D-glucopyranose and synthesis of derivatives of N-(D-glucopyranosyl) pyridine. Acta biochim. Pol. 11 no.4:509-525 '64.

1. Department of Biochemistry, State Institute of Hygiene and Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warszawa.

SIERAKOWSKA, Halina; EDSTROM, J.-E.; SHUGAR, D.

Intracellular localization of nuclease enzymes by a microdissection-microelectrophoretic technique. Acta biochim. Pol. 11 no.4:497-507 '64.

1. Institute of Biochesmitry and Biophysics, Polis Academy of Sciences, Warszawa, and Department of Histology, University of Göteborg, Sweden.

JANION, Celina; SHUGAR, D.

Mutagenicity of hydroxylamine: reaction with analogues of cytosine, 5(6)-substituted cytosines and some 2-keto-4-ethoxypyrimidines. Acta biochim. Pol. 12 no.4:337-355 '65.

1. Department of Biophysics, Institute of Biochemistry and Biophysics, Polish Academy of Sciences; and Department of Biochemistry, State Institute of Hygiene, Warszawa.

SHUGAR, I.
BTR
17, No 11, Nov 1953
Metallography & Primary Structures

2

12621* New Method of Making Replicas for Electron Microscopic Examination of the Surface Structure of Metals. (Russian.) I. Shugar. *Acta Technica Academiae Scientiarum Hungaricae* [illegible] 1952, p. 57-68.

Au and Al were used to prepare replicas of cast iron structures. Method is described.

DEN'YANIKOV, I.G.; SHUGAR, I.V.; GUSEV, V.N.

Quantitative determination of elements by means of a short-wave X-ray spectrometer with a monitor. Zav.lab. 27 no.9:1104-1106 '61. (MIRA 14:9)

1. Institut metallurgii i obogashcheniya Akademii nauk KazSSR.
(Spectrometry)

SHUGAR, I. V.

AID Nr. 977-6 27 May

ENERGY DISTRIBUTION OF SCATTERED NEUTRONS IN WATER (USSR)

Dulin, V. A., Yu. A. Kazanskiy, and I. V. Shugar. Atomnaya energiya, v. 14, no. 4, Apr 1963, 404-405. S/089/63/014/004/011/019

The neutron spectra in water from an ~15 Mev neutron source have been measured at distances of 20 to 90 cm from the source, which was an $H^3(H^2, n)He^4$ reaction with deuteron energy of 400 Kev. A single-crystal fast-neutron scintillation spectrometer with γ-ray discrimination was used as a detector. The results obtained are presented in the form of histograms which can be used for determining the relaxation length for a group of neutrons with energy of 14 to 16 Mev. At distances of 30 to 60 and 60 to 90 cm, the relaxation length was found to be 15.0 $\pm$ 0.8 and 14.7 $\pm$ 0.9 cm, respectively, which is in good agreement with the results obtained previously with a $Cu^{63}(n, 2n)Cu^{62}$ indicator by B. I. Sinitsyn, [AS]

Card 1/1

DULIN, V.A.; KAZANSKIY, Yu.A.; SHUGAR, I.V.

Energy distribution of scattered neutrons in water. Atom. energ. 14 no.4:404-405 Ap '63. (MIRA 16:3)
(Neutrons--Spectra)

L 10288-63 EWT(m)/EPF(n)-2/BDS--AFFTC/ASD/AFWL/SSD--Pu-4

ACCESSION NR: AP3001181 S/0089/63/014/005/0488/0490

63
60

AUTHOR: Dulin, V. A.; Kazanskiy, Yu. A.; Shugar, I. V.

TITLE: Angular energy distribution of neutrons at the boundary of two media

19

SOURCE: Atomnaya energiya, v. 14, no. 5, 1963, 488-490

TOPIC TAGS: neutron scattering, neutron-energy distribution

ABSTRACT: Measurements were made of the spectra of scattered neutrons emerging at various angles at a boundary of water and a plane graphite layer. A fast neutron source with a mean energy of 3.9 Mev was placed at a 20-cm distance from the boundary. An H sup 2 (H sup 2, n)He sup 3 reaction with a deuteron energy of 900 Kev served as the neutron source. The neutron emission at the required angle was effected by means of a conical collimator with an angular resolution of about 5°. The neutrons were recorded with a single-crystal Gamma-discriminated scintillation spectrometer. The pulse amplitude distribution was recorded by means of an AI-100 analyzer. For each scattering angle the amplitude distribution was converted to the

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L 10288-63

ACCESSION NR: AP3001181

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neutron energy spectrum by means of a numerical matrix and by a differentiation method. The difference between the two results did not exceed 20% even in the energy range from 1.3 to 2.0 Mev. The neutron energy spectrum obtained at the graphite-water boundary is shown in the Fig. 1 of Enclosure. The results obtained by integration of angular energy distribution in the range from 0 to 180° are also plotted. The difference between the shape of measured and calculated spectra is due to the difference in geometry. "The authors are thankful to S. G. Tsypin for his valuable observations and to N. D. Proskurnina and V. G. Dvukhsherstnov for their help in the work."
Orig. art. has: 4 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 14Aug62 DATE ACQ: 21Jun63 ENCL: 01

SUB CODE: 00 NO REF SOV: 003 OTHER: 001

Card 2/2

L 24216-65 EWT(m)/EWA(h) DM

ACCESSION NR: AP5001271 S/0089/64/017/006/0486/0492

AUTHOR: Dulin, V. A.; Dvukhsherstnov, V. G.; Kazanskiy, Yu. A.; Shugar, I. V. (deceased)

TITLE: Angular and energy distribution of neutrons at the boundary of two media

SOURCE: Atomnaya energiya, v. 17, no. 6, 1964, 486-492

TOPIC TAGS: angular neutron distribution, neutron energy distribution, fast neutron, boundary problem

ABSTRACT: The authors measured the angular and energy distribution of fast neutrons of 0.4 to 3.4 Mev for water, graphite, aluminum, iron, nickel, and lead, at the boundary: medium-water, after the passage of a thickness equal from 1.5 to 4.6 of the mean free path. The neutron source was the reaction $D(D,n)He^3$. The measurements were made with a single crystal scintillation spectrometer for fast neutrons with a γ-rays discrimination. The comparison of experimental values for the angular distribution with the computation for a single scattering shows that multi scattering plays an important part. The comparison of experi-

Card 1/2

SHUGAR, Yu.A.

Effect of magnesium on the distribution of sugars in plants.
Fiziol.rast. 3 no.1:32-35 Ja-F '56. (MLRA 9:5)

1. Nauchnyy institut po udobreniyam i insektofungisidam (NIUIF), Moskva.
(Plants, Effect of magnesium on) (Botany--Physiology)

SHUGAR, A.I., dotsent, kand.fiziko-matemat.nauk; ROMANOVA, L.V.; SHUGAR, Yu.A.

Spectrum analysis of powders in condensed spark based on the method of two standard additions. Izv.TSKhA no.3:201-202 '59. (MIRA 12:10)

(Spectrum analysis)

SHUGAR, A.I., kand.fiziko-matematicheskikh nauk, dotsent; SHUGAR, Yu.A., starshiy nauchnyy sotrudnik

Photocalorimetric analysis of elements by using the method of calculating by the coefficient and adding interfering ions. Izv. TSKhA no.3:206-211 '60. (MIRA 14:4)
(Calorimetry)

MIROSHNIK, I.A.; SHUGAREV, V.V.

Two-channel pulse generator. Prib.i tekh.eksp. 7 no.1:108 Ja-F '62. (MIRA 15:3)
(Oscillators,Electron-tube)

SHUGAROV, A.I., prof.; SHKOL'NIKOV, A.B., red.; MAKHOVA, N.M., tekhn. red.; PEVZNER, V.I., tekhn. red.

[Physics] Fizika. Moskva, Izd-vo sel'khoz. lit-ry, zhurnalov i plakatov, 1961. 419 p. (MIRA 15:3)

(Physics)

MAGNITSKIY, Konstantin Pavlovich, doktor sel'skokhozyaystvennykh nauk; SHUGAROV, Yu.A., starshiy nauchnyy sotrud.; MALKOV,V.K., nauchnyy sotrud.; prinimali uchastiye: ZUYEVA,N.P., nauchnyy sotrud.; GOSUDAREVA,A.G., laborant; FEDORENKO,M.G., laborant; KAVUN,P.K., red.; BACHURINA,A.M., tekhn.red.; PROKOF'YEVA,L.N., tekhn.red.

[New methods of plant and soil analysis] Novye metody analiza rastenii i pochv. Moskva, Gos. izd-vo sel'khoz.lit-ry, 1959. 239 p. (MIRA 14:5)
(Soils--Analysis) (Botanical research)

SHUGAROVA, Z.I.

Case of severe fibrinous tracheobronchitis in a patient with otogenic sepsis and meningitis requiring emergency tracheotomy. Vest.otorin. 22 no.6:94-95 '60. (MIRA 14:1)

1. Iz otorinolarignologicheskoy kliniki (zav. - prof. I.G. Kozlova) Ryazanskogo meditsinskogo instituta.
(TRACHEA--DISEASES) (EAR--DISEASES) (BRONCHITIS) (MENINGITIS)

GAVRILOV, P.I., kand. tekhn. nauk; SHUGAYENKO, V.V., inzh.

Selecting an efficient shape of cutter nozzle for cutting steel. Svar. proizv. 12:38-39 D '63. (MIRA 18:9)

1. Saratovskiy politekhnicheskiy institut.

SHUGAYEV, V.V., starshiy prepodavatel'.

Statistical processing of the results of testing loess for sagging characteristics. Vop. geotekh. no.4:4-10 '61. (MIRA 18:7)

GAVRILOV, P.I., kand. tekhn.nauk; SHUGAYENKO, V.V., inzh.

Effect of cutting on the structure and properties of steel when using natural gas in the heating flame. Svar. proizv. no.10:28-29 O '65. (MIRA 18:10)

1. Saratovskiy politekhnicheskiy institut.

PANIN, N.S., inzh.; SHUGAYENKO, V.V., inzh.

Universal adjustable boring chuck equipped with stepped cutters. Energomashinostroenie 4 no.9:42-43 S '58. (MIRA 11:11)
(Drilling and Boring machinery)

BEKKER, Ya.Sh.; SHUGAYEV, A.P.

Automatic thread-rolling machine. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 17 no.7:37-38 Jl '64.
(MIRA 17:10)

SHUGAYEV, A S

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Die Wahlen In Den Kapitalistischen Ländern- Ein Mittel Des Betrugs Und Der Unterdrückung Der Werktätigen. Berlin, Dietz, 1954.

40 p.

Translation from the Russian: Bybory V Kapitalisticheskikh Stranakh-Orudiye Obmana I Podvleniya Truyashikheya (N. P., N. D.)

Bibliographical Footnotes.

SHUGAEV, A. Ya.

Hydroinsulating material. Ya. N. Novikov, E. Z. Yudovich, and A. Ya. Shugaev. U.S.S.R. 67,220, Oct. 31, 1946. For water-proofing (foundations, walls, etc.) is used a thin Al sheet coated on both sides with a bituminous compn. In order to impart to the Al sheet the required pliability, the sheet is heat-treated for 2-6 hrs. at 350-400° followed by slow cooling; finally the Al sheet is drawn through the bituminous compn. at 180° and then cooled slowly. M. Hosch